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## OUR SEA-COAST DEFENSES.

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### *Why do we need coast defenses ?*

To protect our wealthy seaport cities from bombardment in times of war, and from forced money contributions levied under threat of bombardment ; to protect our military and naval establishments located on the seaboard, our torpedo stations and navy yards ; to provide harbors of refuge for our merchantmen, and even for our navy ; to prevent the enemy from establishing himself in our waters, by seizing and holding conveniently situated harbors as bases of operations, supply, and, to a certain extent, repair stations ; to insure to ourselves strategic points from which our navy can act offensively ; to provide a defensive line behind which, in a prolonged war, we shall be enabled to increase our navy or even create a new one ; to prevent the enemy from seizing or raiding our commercial centres on the seaboard, thereby paralyzing or seriously interfering with our transportation system, depressing securities and values, and causing distress and suffering to a large portion of our population ; and, finally, by placing ourselves in a proper state of defense, to diminish the chances of war and insure ourselves and our posterity against its evils.

Protection of property is perhaps a more tangible need than any of the others mentioned. In the cities bordering the harbors of Portland, Me., Portsmouth, Boston, Newport, New London, New Haven, New York, Philadelphia, Baltimore, Norfolk, Wilmington, Charleston, Savannah, St. Augustine, Mobile, New Orleans, Galveston, San Diego, San Francisco, Portland, Or. (mouth of Columbia River) and the important ports on the Great Lakes ; there is approximately six thousand million dollars worth of destructible property ; that is, property which might be destroyed by the fire of a hostile fleet.

Should such a fleet occupy New York Bay and bombard the surrounding cities, it would endanger and might destroy by demolition, by bursting bombs and nitro-gelatine shells, and by the

fires resulting therefrom, property valued at one thousand five hundred millions in New York City, one hundred millions in Jersey City and six hundred millions in Brooklyn. Nor would the effects of such bombardment be limited to the destruction of property. The privations, suffering and loss of life to which the populace would be subjected would be appalling, for even should the enemy grant a reasonable time for the removal of non-combatants, neither threats, nor persuasion, nor even force could secure the safety of more than a small per cent. of the population of those great cities.

The comparatively slight results attained in the way of destruction of life and property in the many bombardments recorded in history form no criterion for the future. Such bombardments have generally been directed against the defenses rather than the city itself. The guns formerly used were far less powerful than modern naval ordinance, and nitro-gelatine, dynamite, or some similar high explosive would now be used for bursting charges in place of powder. The bombardment of Alexandria was directed against the fortifications, yet the city suffered severely solely through lack of accuracy on the part of the gunners of the fleet. There would be no missing such a mark as New York City.

The only alternative to such a bombardment would be the payment of a ransom, which, in the case of New York, would probably be not less than one hundred million dollars.

A possible result of the presence of a hostile fleet in the bay, and one rarely contemplated, is *the cutting off the food supplies from New York City and Brooklyn*. With the bay and the lower Hudson in the possession of the enemy, all communications would be cut with the exception of the Harlem and New Haven railroads, and even these would be within easy range. Under the most favorable circumstances these two roads would not be adequate to the daily demands of two million people, and it is certain that great distress, if not actual starvation, would result from such a condition of affairs if long continued. During the railroad riots of 1877, and at various times during snow blockades in the West, the dependence of our great cities on the railroads for daily food supplies has been made manifest; but at no time have we felt the pressure as we would in case of war.

As an insurance against war, the value of strong defenses is evident. There is no surer way of avoiding war than by such a

thorough preparation as leaves no weak point exposed to an enemy's attack and no temptation to his cupidity.

*Are we properly protected by our present fortifications?*

Prior to 1860, we had one of the best systems of coast defense in the world. Our works were model types of masonry fortifications. Emerging from the great struggle of 1861-5 with a national debt of nearly three thousand million dollars, with our merchant marine annihilated, with one per cent. of our total population—the very flower of our manhood—left dead on the battle-fields of the South, with another half million of maimed and battle-scarred veterans, many of whom became pensioners on the government's bounty, with factories closed and business stagnant, with depreciated securities and with the South reduced to poverty and forced to begin life anew with an overturned social system of a century's growth; it is not surprising that our navy was left to decay and our fortifications to crumble away. Filled with pride at the record of those four years, we felt able to defy the world, and every energy was bent towards the revival of our languishing industries.

The period since 1865 has, however, been a momentous one in the development of military art and science. The breech-loading system of heavy ordnance has been definitely adopted by all nations, and guns have grown in strength and power up to the one hundred and twenty ton forged steel rifles of Krupp, which, with nearly half ton powder charges, throw a full ton of metal to distances beyond ten miles and penetrate two and a half feet of iron a thousand yards away. We see ships encased in over twenty inches of steel and armed with guns weighing one hundred tons and over. Improved designs of hulls, boilers and engines have increased the speed to over fifteen knots\* per hour; and the mechanical development of the various types of movable torpedoes has led to the construction of immense fleets of fast torpedo boats.

In the Shoeburyness experiments with the Woolwich eighty-ton muzzle loading gun, firing a one thousand seven hundred pound projectile, a penetration was obtained of twenty-five feet in granite and thirty-two feet in best Portland cement concrete. The one hundred and ten ton breech loader of 1884 has nearly double the muzzle energy of the Woolwich gun, and recent Eng-

\* At the final trial (April 19, 1886) of the English belted cruiser "Orlando," a mean speed of 19½ knots (22½ miles) was attained.

lish ships are being armed with these weapons. Our masonry forts cannot withstand such an armament. In fact the granite splinters scattered by each penetrating projectile would be an additional source of danger to our cannoneers.

The navy cannot protect us, for we practically have no navy. In his annual report for 1885, Secretary Whitney says : " At the present moment it must be conceded that we have nothing which deserves to be called a navy. It is questionable whether we have a single naval vessel finished and afloat at the present time, that could be trusted to encounter the ships of any important power—a single vessel that has either the necessary armor for protection, speed for escape, or weapons for defense."

Since the above was written, several new cruisers have been added to our navy, but judging from the published reports, their efficiency is at least doubtful.

Even had we the finest navy in the world it would not protect us, as the points of attack are too numerous to be covered by one or even a dozen fleets. This was well illustrated by the maneuvers of the British fleet during the past summer. The naval operations which followed the Grand Naval Review of the Queen's Jubilee culminated in a division of the fleet and an attack on the British coast by the weaker fleet under Admiral Freemantle. Within twenty-four hours from the declaration of war, Falmouth was captured and the shipping destroyed. All attacks by torpedo boats were discovered and frustrated ; the coast defense flotilla was captured or destroyed ; the Channel squadron under Admiral Hewitt was successfully evaded, and the hostile fleet entered the Thames, destroying the shipping and shelling the London docks. For the first time in two hundred years the inhabitants of London heard the sound of hostile cannon.

These maneuvers created a great sensation in Great Britain. In commenting on the results achieved by Admiral Freemantle, a prominent English authority says : " The only safeguard appears to be a better system of coast defense. The days are past when " Britannia needs no bulwark!"

If the Imperial navy could not protect the coasts of the British Isles, how would it be with our five-thousand mile coast line ?

Torpedoes will not protect us. They are only auxiliaries to the forts and can be removed and destroyed with comparative ease unless protected by the fire of strong land batteries. Moreover,

our visible supply is limited to a few incomplete mines in store at four of our chief ports.

Such is, in brief, our condition to-day. Our wealthy seacoast cities lie at the mercy of any hostile fleet.

*What is the probable strength of the attack we may expect in case of war?*

Of modern armored ships available for foreign service, England has about thirty-eight, France twenty-eight, Germany twenty-three, Russia ten, Italy eight, Turkey six, Austria nine, Holland eight, Denmark four, Spain five, Brazil five, Japan two, China two and Chili three. The list of unarmored ships far exceeds the above and includes many powerful cruisers.

The imagination can hardly conceive the power of these big guns. The flight of the rifle ball is a favorite simile for swiftness, yet the initial velocity of the Springfield rifle is only about one thousand three hundred and thirty feet per second, while the one hundred and ten ton gun with its nine hundred pound powder charge, throws nearly a ton of metal with a velocity of two thousand and twenty feet per second, half as fast again as the bullet.

There are fifteen ships afloat carrying guns having a range of ten miles or upwards, of which England has three, France six, Italy one, Germany three, and China two. There are twenty-nine ships building or fitting out that will also carry such armaments, of which England has nine, France twelve, Italy four, Russia three, and Denmark one. There are twenty-four ships afloat carrying guns ranging from nine to ten miles, of which England has one, France eight, Italy two, Germany twelve, and Brazil one. Of ships protected by armor having a thickness of twenty or more inches, England has one, France three, and Italy four. Of ships protected by armor having a maximum thickness of fifteen to twenty inches, England has twelve, France fourteen, Italy five, Russia four, Germany four, and Spain one. (These figures include ships now building.) The heaviest armor consists of twenty-four inches of wrought iron on the English ship "Inflexible," nineteen and five-eighths inches of compound armor (iron and steel) on the French ships "Terrible," "Requin" and "Indomptable," and 21.67 inches of steel on the Italian ships "Duilio" and "Dandolo." The Italian ships "Re Umberto" and "Silicia," now building, will be armored with twenty-nine and one-half inches of steel.

In case of war we may expect attacks from fleets of such vessels with their attendant unarmored cruisers, transports and torpedo boats.

*Can a secure defense be made against such a powerful attack?*

In the gun-armor contests of the past twenty-five years, the gun-makers have kept pace with the plate-makers, and there is not a single armored ship now afloat that cannot be pierced by the projectiles of modern ordnance. If our harbors are supplied with such ordnance, properly mounted behind secure cover, and equipped with modern appliances for maneuvering guns and handling ammunition; if the channels be well studded with automatic electric torpedoes; and the naval contingent of torpedo boats, gun boats, floating batteries, monitors and war ships be provided, we have a secure defense.

*What will be the cost of defense?*

For all important coast and lake\* harbors the Fortification Board have estimated the cost of a complete system of defenses, including armored turrets and casements, barbette and mortar batteries, rifled guns, torpedoes, torpedo boats and floating batteries, at \$126,377,800,† distributed as follows:

New York .....	\$23,948,500	Savannah.....	\$2,243,000
San Francisco.....	27,868,150	Galveston.....	950,500
Boston.....	10,910,250	Portland, Oregon.....	2,919,000
The Lake ports.....	4,136,800	Pensacola.....	948,000
Hampton Roads.....	7,492,000	Wilmington, N. C.....	1,942,000
New Orleans.....	11,710,500	San Diego.....	504,000
Philadelphia.....	3,838,250	Portsmouth, N. H.....	965,350
Washington.....	1,323,500	Cumberland Sound.....	636,000
Baltimore.....	2,184,000	Kennebec River.....	298,000
Portland, Me.....	5,305,500	New Bedford.....	522,000
Narragansett Bay.....	4,253,000	Penobscot River.....	298,000
Key West.....	3,406,500	New Haven.....	472,000
Charleston.....	2,244,500		
Mobile.....	2,738,000		
New London.....	2,320,500		
		Total.....	\$126,377,800

*Is the probability of our becoming involved in a foreign war sufficiently great to warrant precautionary measures involving such immense outlays?*

It is claimed that our geographical isolation and our non-aggressive foreign policy, so remove us from the vortex of European

\* Many of these are so situated geographically as to make it impossible to protect them from bombardment by land fortifications. At none would such elaborate works be constructed as are required on the coast.

† In 1826, the Board of Engineers estimated sixteen and a half millions as the total cost of defending our entire coast from Mount Desert Island to the Louisiana frontier; now twenty-four millions are required for New York Harbor alone.

politics that there is no reason why a "just, equitable and upright government, such as ours," should not pursue indefinitely the paths of peace. Such ideas are fallacious. Wars frequently result from trivial causes. It is not necessary that we should be the aggressors. Grasping rulers or ambitious ministers may place us on the defensive, and strive as we may to avoid war, the insult may be too great to be condoned or the challenge too offensive to be declined.

Our geographical isolation is no longer a practical reality. The locomotive, the screw-propeller and the submarine cable have annihilated space and time. Liverpool is now but six days from New York, and in war we measure distances by time, not miles.

It is true that there is no immediate prospect of war, but war can rarely be foretold. Our population comprises some millions of foreigners who have taken upon themselves the character of American citizens, with all the rights and privileges of such. These we are bound to protect in their acquired citizenship. When Martin Koszta, the Hungarian patriot and naturalized American, was seized and conveyed on board an Austrian man-of-war in the harbor of Smyrna, Captain Ingraham cleared his ship for action and demanded and secured Koszta's release at the muzzles of his guns. His action is significant of our policy in this respect. Complications have frequently arisen concerning our German citizens, and the ever turbulent Fenian element in our midst has in the past, and, doubtless, will in the future, strain our relations with England to near, and perhaps beyond, the "limit of elasticity." Who can foretell the ultimate result should some disciple of O'Donovan Rossa repeat Boyton's feat in New York harbor with a loaded torpedo?

The problem of the Canadian fisheries is still unsolved. The control of the Panama Canal, the enforcement of the Monroe Doctrine in these days of colonial thefts, the conservation of our vast moneyed interests in Mexico, the determination of the Alaskan boundary, in fact a thousand unforeseen incidents may at any moment involve us in diplomatic controversies which can only be settled by the sword. The progress of civilization may have shortened the duration but it has not diminished the frequency of wars. The day "when swords shal. be beaten into plowshares and spears into pruning hooks" may be coming, but its shadow is not yet visible.



Judge Hoar said two years ago, in the Senate Chamber: "Our condition is well known to foreign nations. The absolutely defenseless condition of all our coast is well known abroad. The late Minister of Foreign Affairs in France said to one of our own statesmen, not long since, 'How about your defenses? In the intelligence department of our War Office,' said he, 'we have a drawing of every military work of consequence on the whole American coast line, with comments on their strength. There is not a first-class fortification among them all. Do you know how long it takes to build a first-class modern gun?' said the French Minister. The American replied that he did not. Lacour said: 'It takes a whole year. Your cities would be shelled and sacked and laid under tribute while you are creating a navy; and how could you rebuild your fortifications with one thousand-pound shells falling about the ears of your workingmen? Be sure'—now mark this—'Be sure that the defenseless condition of your country is thoroughly well known and commented upon by every power in Europe that would gladly see you humbled, for, as I said, your prosperity is a dangerous menace to all the nations of the Old World except France.'"

Will the nations that would gladly see us humbled be uninfluenced by the sight of our unprotected coast, dotted with wealthy seaports? Can we expect that they will hesitate about taking part themselves in the humbling process, when a favorable opportunity is presented?

*Shall liberal appropriations be made for our coast defenses?*

As our present forts and guns are of obsolete types, and as no nation has yet felt able to dispense with coast defenses, the urgent necessity for such liberality is evident. Congress has failed to make any appropriation for the construction of fortifications since 1875, and the annual appropriations "for preservation and repairs" have not sufficed to preserve our unfinished works. The ordnance department has been similarly restricted, the bulk of the appropriations being for experimental purposes, and even then grudgingly appropriated.

The reports of the Getty Board, the Logan, Hawley and Randall committees, the Gun Foundry and Fortification boards, contain a mass of valuable information which should have convinced Congress of the necessity of action. While the reports of the Congressional committees have not always contained specific

recommendations, the Gun Foundry and Fortification boards presented well-matured plans for the gradual amelioration of our present deplorable condition. These are, in brief : the establishment of a gun factory for the navy at the Washington Navy Yard ; another for the army at the Watervliet Arsenal, Troy, New York ; an appropriation of one million dollars for each, and a further appropriation of fifteen million dollars for the purchase of forged and tempered steel parts for the fabrication of guns. The Fortification Board, after setting forth in detail the cost of the defenses at each of the twenty-seven ports considered, recommended the appropriation of the following sums : Eight million dollars for the purchase of gun metal from private manufacturers ; one million dollars for the establishment of the Watervliet gun factory, and twelve million five hundred thousand dollars for beginning the defenses at the more important ports.

The bill recently introduced in the Senate by the chairman of the Committee on Coast Defenses (Senator Dolph) is based on the recommendations of the Fortification Board. It appropriates \$126,000,000 to be made available in ten annual installments of \$12,600,000 each. Let us see if there is any good reason why it should not become a law.

Granting the necessity of any expenditure at all, the proposed outlay is not disproportionate either to the value of the property to be protected or to our resources. Twelve millions a year is only two-tenths of one per cent. of the value of the property now exposed, and a nation of sixty million people, with an annual income of \$371,000,000 and a treasury surplus of \$175,000,000 can surely afford to pay ten or twelve millions annually for twelve years for such a necessary purpose.

The common arguments against this and similar bills may be briefly summarized as follows : (1) Political expediency. (2) We shall have no more foreign wars ; no nation dare attack us. (3) Guns and forts can be improvised when war becomes imminent or is actually upon us. (4) There is no necessity for immediate action. We can wait the further development of guns and armor, and ultimately profit by the costly experiments of foreign powers.

Of those who would disregard the constitutional mandate "to provide for the common defense," who would sacrifice our gen-

eral welfare to the advancement of local interests, I have nothing to say. They are politicians—not statesmen.

That we shall have no more foreign wars is the dream of a visionary or the boast of American pride. We cannot expect exemption from natural laws. Our present condition invites attack.

It takes years to construct modern forts and guns, they cannot be improvised. The Fortification Board estimated that should their plan of most liberal appropriations be adopted by Congress, it would take twelve years to complete our defenses. Under pressure this period might be considerably reduced, at the sacrifice of efficiency and economy, but not to anything like the brief time we would probably have available before the actual commencement of hostilities. The very fact that we are so totally unprepared would tend to precipitate the declaration of war, should such a misfortune become imminent. It takes one year to build a modern large-calibred gun in a well organized factory. The Gun Foundry Board estimated that it will require three years to complete the tools, construct the shops, and establish the plant for the Watervliet factory, after the appropriation shall be made available. It would be at least two years more before a 16-inch rifle could be completed.

The fourth argument is the most specious, and therefore the most dangerous. For fifteen years the conservative English clung to their muzzle-loading wrought-iron rifles; to-day the Woolwich “infant” and the famous eighty-ton gun are but types of a past era in the art of gun making. All prejudice has finally been swept aside, and now England is producing all-steel guns as Krupp did forty years ago. As heavy ordnance has increased in weight and power, we have seen the most powerful warships reduced to second and third rates, so far as their defensive armor is concerned, and impregnable armored forts of one period have become easily penetrable in the next decade. The ever-varying contest between big guns and defensive armor has attracted the attention and aroused the interest of the civilized world, and the plate tests at Shoeburyness, Spezzia, Buckau, Bucharest and elsewhere have repeatedly reversed popular opinion and upset the best conceived theories. Naturally one asks when will this contest cease? Is there no final result to be attained, no limit that cannot be passed?

Man’s ingenuity is boundless and it is probable that the future will see armor of greater resistance and guns of greater power than

we now have. The weight of naval armor is, however, limited by the ship's flotation, while for land batteries, with the exception of revolving turrets, weight is a minor consideration. Heavy steel guns are very expensive, costing approximately one thousand dollars per ton, and those of the largest calibre will be very limited in numbers. The preponderance of fire on the side of the defense is obtained by multiplying the number of medium-calibred rifles. The "building up" or assembling the parts of a modern gun is an operation requiring great nicety of detail and mechanical skill only to be attained by familiarity with the work. Such skill is to be acquired in the construction of small and medium calibred guns, of which large numbers are needed. For the defense of the twenty-seven ports previously enumerated, we require forty-eight sixteen-inch, twelve fourteen-inch, two hundred and three twelve-inch, two hundred and thirty ten-inch, one hundred and two eight-inch, and four six-inch rifles, and seven hundred twelve-inch, and twenty-four ten-inch mortars. After the completion of the gun factory, it will take at least eight years, with liberal appropriations, to fabricate these guns and mortars. As, at the best, four years must elapse before we can produce any guns at all, it would seem wise to take the initial step without further delay.

Concerning our forts, the Chief of Engineers remarks, in his annual report for 1887: "From the difference of opinion which exists among certain non-military experts as to the character of armor to be used in land defenses, it has been argued that the whole subject of seacoast defense is in an unsettled and tentative condition, and that the policy of inaction now existing should still continue. But the facts will not warrant this conclusion, as more than nine-tenths of the armament recommended for our seacoasts is not to be mounted behind iron protections, but in rear of earthen covers surmounting and shielding the masonry magazines, bomb-proofs and store rooms. Particularly is this true of the rifled mortars, which must hereafter play an important part in the defense of our channels and fairways, and there is no reason why the erection of the batteries required for them should be delayed a single month. Neither is armor required for guns mounted on lifts or disappearing carriages; in a word, proper sums may judiciously be expended and much progress toward placing our coasts in a defensive condition may be made. indeed

must be made, before the question of armor demands consideration."

In the face of these facts, and in view of our present financial condition, it seems impossible that Congress should still neglect to make provision for our defenseless coasts.

EUGENE GRIFFIN.